More Genetic Diversity for Onions

Onion breeders have developed a new source of cytoplasmic male sterility (CMS). A CMS line is used as the female parent to produce commercial onion hybrids. Most hybrid onion seed is produced using a single source of CMS called S cytoplasm, which traces back to a single plant identified in Davis, California, in 1925.

Since 1940, commercial onion breeders have relied on the ARS source of CMS to produce onion hybrids. But reliance on a single source of hybrid onion seed could lead to a disastrous scenario in onions similar to the epidemic of southern corn leaf blight on corn in 1970. The new source of CMS may help diversify male-sterile cytoplasms, reducing the genetic vulnerability of onions and providing more stable production of bulb and seed onions at stable costs.

Since the ARS onion breeding program began in 1936, agency breeders have released more than 40 hybrids and 70 inbred lines of onions to public and private breeders. They presented the new CMS source at the 1999 National Onion Research Conference in December. *Michael J. Havey, USDA-ARS Vegetable Crops Research Laboratory, Madison, Wisconsin; phone (608) 262-1830, e-mail mjhavey@facstaff.wis.edu.*

Daily Feedings Boost Catfish Production

Catfish growers who feed their fish each day—rather than every other day—can increase production. Researchers raised production 30 percent by feeding 30 percent more feed and offering it daily. This regimen increased fingerlings' weight by 70 percent. Fingerling growth accounted for the overall 30-percent increases in ponds where young and old fish were raised together. Weight gains of larger fish were neither helped nor hindered by feeding frequency.

Until now, some catfish farmers have

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fed mixed sizes of catfish every other day when water temperature has risen to 90 °F. That was because daily feedings in hot weather can deplete oxygen in ponds, creating an unhealthy situation for the fish. But the installation of highly efficient mechanical aeration can take care of that problem.

In this 30-week study, researchers stocked 9 ponds at a per-acre rate of 2,000 large fish and 6,000 fingerlings. They supplied as much feed as the fish would eat either daily or every other day. While fingerlings gained much more by being fed every day, larger fish gained the same amount under either regimen. The larger fish apparently made up for not having daily meals by snacking on the fingerlings, since about 14 percent fewer fingerlings survived in ponds supplied with feed every other day. *Donald L. Freeman, USDA-ARS Aquaculture Systems Research Unit, Pine Bluff, Arkansas; phone (870) 543-8128, e-mail dfreeman@spa.ars.usda.gov.*

Fruit Coatings Forestall Postharvest Decay

New biocontrol coatings for fruit are being made of reformulated shellac and sucrose ester, a compound derived by combining sugar with a fatty acid. These coatings help maintain quality by promoting the growth of beneficial bacteria and yeasts naturally present on the fruit surface.

Beneficial microbial populations outcompete decay-causing microbes for nutrients at a critical early stage in the pathogens' development—in effect, starving them. The chemicals normally used to preserve fruit on its way to market have been found to kill such beneficials.

Scientists and cooperators with Mantrose Haeuser Co., Inc., of Westport, Connecticut, have tested both reformulated shellac and sucrose ester coatings for their ability to reduce development of off-flavors caused by the buildup of ethanol naturally released by the fruit. Preliminary results from tests on grapefruit indicate that both coatings allow for a better exchange of oxygen and carbon dioxide than commercial chemicals permit, with sucrose ester outperforming reformulated shellac in these tests. *Raymond G. McGuire, USDA-ARS Subtropical Horticulture Research Station, Miami, Florida; phone (305) 254-3641, e-mail miarm@ars-grin.gov.*

Plants That Summon Their Own Defenders

When tobacco budworm *(Heliothis virescens)* and corn earworm *(Helicoverpa zea)* caterpillars chew on certain plants, chemical cues in their saliva cause the plants to send out defensive signals. Small wasps that are natural enemies of the caterpillars then follow the signals to find and sting these pests that are a major problem in cotton, corn, soybean, sorghum, sunflower, tobacco, and peanuts.

This research builds on previous findings that beet armyworm caterpillars elicit a chemical SOS response in plants. Interestingly, the budworms and earworms have been found to produce the same compounds found in the saliva of beet armyworms. And it seems that plants are able to distinguish which insects are nibbling on their leaves and give off the proper distress signal to attract that insect's natural enemy. By studying plant-insect interactions, it may be possible to develop plant varieties with more powerful chemical defenses against insect pests. *Consuelo De Moraes, USDA-ARS Center for Medical, Agricultural, and Veterinary Entomology, Gainesville, Florida; phone (352) 374-5912, e-mail cdemoraes@gainesville.usda.ufl.edu.*